Maharishi Mahesh Yogi Vedic Vishwavidyalaya

DIRECTORATE OF DISTANCE EDUCATION

Syllabus

Bachelor of Computer Application (BCA)
w. e. f. July 2012

BCA – I SEMESTER

S. No.	Paper Code	Paper No.	Paper Name	Marks
1.	1DSBCA1	I	Maharishi Vedic Science – I	100
2.	1DSBCA2	II	Fundamentals of Computer and Information Technology	100
3.	1DSBCA3	III	PC Packages	100
4.	1DSBCA4	IV	Programming Methodology and C Programming	100
5.	1DSBCA5	V	Digital Electronics	100
6.	1DSBCA6	VI	Practical – 1DBCA3, 1DBCA4 and 1DBCA5	100

BCA – II SEMESTER

S. No.	Paper Code	Paper No.	Paper Name	Marks
1.	2DSBCA1	I	Maharishi Vedic Science – II	100
2.	2DSBCA2	II	Internet and Web Page Designing	100
3.	2DSBCA3	III	Programming in Visual Basic	100
4.	2DSBCA4	IV	RDBMS using Oracle	100
5.	2DSBCA5	V	Elementary Mathematics	100
6.	2DSBCA6	VI	Practical – 2DBCA2, 2DBCA3 and 2DBCA4	100

BCA – III SEMESTER

S. No.	Paper Code	Paper No.	Paper Name	Marks
1.	3DSBCA1	I	Data and File Structures	100
2.	3DSBCA2	II	System Analysis and Design	100
3.	3DSBCA3	III	C++ Programming	100
4.	3DSBCA4	IV	Discrete Mathematics	100
5.	3DSBCA5	V	Communicative English	100
6.	3DSBCA6	VI	Practical – 3DBCA1 and 3DBCA3	100

BCA – IV SEMESTER

S. No.	Paper Code	Paper No.	Paper Name	Marks
1.	4DSBCA1	I	Object Oriented Technology and Java Programming	100
2.	4DSBCA2	II	Fundamentals of Computer Network	100
3.	4DSBCA3	III	Analysis and Design of Algorithm	100
4.	4DSBCA4	IV	Advance Calculus and Matrices	100
5.	4DSBCA5	V	Communicative Hindi	100
6.	4DSBCA6	VI	Practical – 4DBCA1 and 4DBCA2	100

BCA – V SEMESTER

S. No.	Paper Code	Paper No.	Paper Name	Marks
1.	5DSBCA1	I	Introduction to Software Engineering	100
2.	5DSBCA2	II	Introduction to Operating System	100
3.	5DSBCA3	III	Social Science	100
4.	5DSBCA4	IV	Statistical Techniques	100
5.	5DSBCA5	V	Principle of Management and Business Communication	100
6.	5DSBCA6	VI	Practical - 5DBCA2 and 5DBCA4	100

BCA – VI SEMESTER

S. No.	Paper Code	Paper No.	Paper Name	Marks
1.	6DSBCA1	I	Science of Communication and E – Commerce	100
2.	6DSBCA2	II	Network Programming and Administration	100
3.	6DSBCA3	III	Web Programming and Web Development	100
4.	6DSBCA4	IV	Computer Oriented Numerical Technique	100
5.	6DSBCA5	V	Practical – 6DBCA3 and 6DBCA4	100
6.	6DSBCA6	VI	Project	100

Fundamentals of Maharishi Vedic Science

(Maharishi Vedic Science – I)

UNIT - 1

Meaning & importance of Guru Pujan.

Meaning of meditation, Mann, Intelligence, Chita, Ego, Thought .

UNIT - II

Name of forty areas of Vedic Science and their expression in Human Physiology and characteristics of consciousness.

Consciousness, types of consciousness, characteristics of higher stages of consciousness.

UNIT - III

Maharishi's Yoga, Transcendental Meditation- a general Introduction, Types of Speech, TM Sidhi Programme, Principle of Yoga Asanas and their Concept.

UNIT - IV

Introduction: Maharishi Vedic Management.

Fundamental elements of Vedic Management –Totality

Management of Science and Art .

UNIT - V

Vedic Management and Leadership.

The Idea Leadership is based upon the Totality of Employee's Style

Suggested Readings:

- ➢ Chetna –His Holiness Maharishi Mahesh Yogi Jee
- ➢ Maharishi Sandesh - 1 and 2 , II-His Holiness Maharishi Mahesh Yogijee
- ➢ Scientific Yoga Ashanas –Dr. SatPal.
- ➢ Dhyan Shailly by Brahmchari Dr. Girish Ji

Fundamentals of Computer and Information Technology

UNIT-1

Introduction to computer and information technology : History of development of computers, computer system concept , characteristics, capabilities and limitation , types of computer – analog, digital, hybrid, general, special purpose, micro, mainframe, super, generation of computer, personal computer (PCs) –IBM PCs, characteristics, PC/PCXT/PCAT-configurations, Pentium and Newer PCs specification and main characteristics, types of PCs-Desktop, Laptop, Notebook, Palmtop, Workstation etc , their characteristics.

Computer Organizations and Working: Basic component of a computer system –control unit, ALU, INPUT /Output function and characteristics, memory –RAM, ROM, EPROM, PROM and other types of memory.

UNIT-II

Input Devices: Keyboard, Mouse, Trackball, Joysticks, Digitizing tablet, Scanner, Digital Camera, MICR, OCR, OMR, BAR-CODE Reader, Voice Recognition, Light Pen, and Touch Screen.

Output Devices: Monitor –characteristics and types of monitor –digital, analog size, resolution, refresh rate, Interlaced /Non Interlaced, Dot Pitch, Video Standard –VGA,SVGA,XGA etc, Printer –Daisy wheel, Dot Matrix, Inkjet, Laser, line printer , plotter, sound card and speakers.

UNIT-III

Storage Devices: Storage Fundamental –Primary VS Secondary, Data Storage and Retrieval method –Sequential, Direct and Index Sequential, Various Storage Devices –Magnetic Tape ,Magnetic disks, Cartridge Tape, data drives, hard disk drives, floppy (Winchester disks), Disks, Optical Disks, CD,VCD,CD-R,CD-RW, ZIP Drive.

Computer Software: Need, types of software –system software, application software, system software-operating system, utility program, programming Language, assemblers, compiler and interpreter.

UNIT-IV

Operating System: Function, types –Batch, Single, Multiprogramming, Multiprocessing. Programming languages- Machine, Assembly, High Level and 4GL. Merit and Demerits of Programming Languages.

Disk Operating System (Dos) Introduction History & version of Dos basic –physics structure of disk drive name , Fat ,File & directory structure and naming rules , booting process , Dos system files. Dos command: Internal –DIR , MD , CD,RD,COPY,DEL, REN , VOL,DATE,TIME,CLS,PATH, TYPE etc. External – CHKDSK, XCOPY, PRINT, DISKCOPY, DISKCOMP, DOSKEY, TREE,MOVE, LABEL, APPEND, FORMAT, SORT, FDISK, BACKUP, EDIT, MODE, ATTRIB , HELP, SYS ,etc Executable V/s Non executable file in Dos.

Number System: Data representation in computer, number system of computer –Binary, Octal, Hexa-Representation & their conversion, coding system –ASCII, BCD, EBCDIC etc.

UNIT-V

Data Communication and Networks: communication channels –twister, coaxial, fiber, optic. Types of Networks –LAN, WAN, MAN etc, Topologies of LAN –Ring, BUS, STAR, MESH and TREE topologies , components of LAN-media , NIC,NOS, Bridges, HUB, Routers Repeater and Gateway .

Computer virus: Virus working principles, types of viruses, virus detection and prevention, viruses on networks. Use of communication and IT in daily life.

An Introduction : Modern Science and Vedic Science, Unified Field based Computer Science.

Text & Reference Books:-

1. Learning Window 98 step by step by Rajeev Mathur , BPB Publication.
2. Learning Word 97 for Window by Rajeev Mathur , BPB Publication,
3. Learning Excel 97 for Window by Rajeev Mathur , BPB Publication.
4. A First Course in Computer by Sanjay Saxena , Vikas Publishing House New Delhi.
5. Microsoft Office 2000 by A. Mansoor by Pragya Publications.
6. Office 97 Interactive Course by Greg Perry, Tec media.
7. Microsoft Office 2000 by A. Mansoor by Pragya Publications.

PC Packages

UNIT-I

Word-processing : MS-Word : Introduction to word processing, introduction to MS –Word: features, creating ,saving and opening document in word , interface , Toolbars , Ruler, Menus, Keyboard Shortcut, Editing a document – moving, scrolling in a document, opening multi document window, editing text selecting , inserting, delete , moving text, previewing document, printing document – Print a document from the standard toolbars, print a document from the menu , shrinking a document to fit a page, reduce the number of pages by one, formatting document: paragraph format, Aligning text and Paragraph, Border and shading, header and footer, multiple columns.

UNIT-II

Word-processing: Advanced Feature of MS Word: Find and replace, checking the grammar and spelling, formatting via find and replace, using the thesaurus, using Auto correct, Auto complete and Auto Text, Word count, Hyphenating, Mail merge, mailing labels Wizard and Templates, handing graphic, tables insert and modification, converting of tables, converting a word document into various formats like – Text, Rich Text Format, Word Perfect, HTML etc.

UNIT-III

Worksheet : MS-Excel : Worksheet basics, Creating worksheet, entering data into worksheet, heading information, data, text dates, alphanumeric, values, saving & quitting worksheet, opening and moving around in an existing worksheet, toolbars and menus , keyboard shortcut , working with single and multiple worksheet , coping, renaming, moving between work books, working with formulas & cell referencing – Auto sum, Coping formulas, absolute & relative addressing, working with range – creating editing and selecting range, formatting of worksheet – Auto format, changing –alignment, character styles, column width, date format , border & colors, currency sign.

UNIT-IV

Worksheet : MS-Excel: Previewing & Printing Worksheet- Page setting , print titles ,Adjusting margins, page break , headers and footer, graphs and chart – using wizard, various chart types, formatting grid lines & legends , previewing & printing charts , database – creation , sorting, query & filtering a database , function – database , date and times, maths & Trigonometry, statistical, Text and logical function, creating and using macros, multiple worksheet – concept, creating and using.

UNIT-V

MS PowerPoint: Introduction and area of use, working with MS PowerPoint, creating a new presentation working with presentation, using wizards, slides& different views, deleting coping slides, working with notes, handout, columns and list, adding graphics, sound and movies to a slide, working with power point objects designing and presentation of a slide show, printing and presentation, notes, Handouts with print options.

Outlook Express: Setup E-mail account with outlook, sending and receiving mail through outlook, concepts of CC,BCC, forwarding mail, draft message, formatting E-mail message, Concept of MIME protocol, attaching files and items into messages, inserting hyperlink using outlook editor and using send and receive group mails, opening received message, opening message with attachment, replying to mail forward message flagging for further action, setting email options, managing contacts with outlook, setting up multiple email accounts on single machine.

Reference Books:

- Window XP Complete Reference , BPB Publication
- MS Office XP Complete BPB Publication
- IT Tools and Applications Pragya Publications

Programming Methodology and C Programming

UNIT - I

Program Concept, Characteristics of Programming, Various Stages in Program Development, Algorithms, Flow Charts, Programming Techniques – Top Down, Bottom Up, Modular, Structured, Features, Merits, Demerits and Their Comparative Study. Programming Logic - Simple, Branching, Looping, Recursion, Programming Testing & Debugging.

UNIT- II

Introduction to C Language, C Language Standards, Features of C, Structure of C Program, Introduction to C Compilers, Creating and Compiling C Programs, IDE, Features of Turbo C Compiler. Keywords, Identifiers, Variables, Constants, Scope and Life of Variables, Local and Global Variable, Data Types, Expressions. Operators - Arithmetic, Logical, Relational, Conditional and Bit Wise Operators, Precedence and Associativity of Operators, Type Conversion. Basic Input/Output Library Functions ,Character Input/Output getch(), getchar(). getche(), putchar(). Formatted Input/Output - printf() and scanf(), Mathematical & Character Functions.

UNIT- III

Declaration Statement, Conditional Statement - if Statement, if else Statement, Nesting of if... .else Statement, else if Ladder, The ?: Operator, switch Statement. Iteration Statements - for Loop, while Loop, do-while Loop. Jump Statements: break, continue, goto, exit(). Arrays - Concept of Single and Multi Dimensional Arrays Strings: Declaration, Initialization, Functions .

UNIT – IV

The Need of C Functions, User Defined and Library Function, Prototype of Functions, Prototype of main() Function, Calling of Functions, Function Arguments, Argument Passing: Call By Value and Call By Reference, Return Values. Nesting of Function, Recursion, Array as Function Argument, Command Line Arguments, Storage Class Specifier - Auto, Extern, Static, Register.

UNIT - V

Defining Structure, Declaration of Structure Variable, Type def, Accessing Structure Members, Nested Structures, Array of Structure, Structure Assignment, Structure as Function Argument, Function that Return Structure, Union.

TEXT & REFERENCE BOOKS:

• *BALAGURUSWAMY, "PROGRAMMINGIN C ", TMH PUBLICATIONS*
• *GOTTFRIED SCHAUMS OUTLINE SERIES, "PROGRAMMING WITH C ", TMH PUBLICATIONS*
• *MAHAPATRA, " THINKING IN C ", (PHI)PUBLICATIONS*
• *ANURAG SEETHA, "INTRODUCTION TO COMPUTERS AND INFORMATION TECHNOLOGY", RAIN PRASAD & SONS, BHOPAL*
• *S.K. BASANDRA, "COMPUTERS TODAY", GALGOTIA PUBLICATIONS.*
• *PETER JULIFF "PROGRAM DESIGN" PHI PUBLICATIONS*

DIGITAL ELECTRONICS

UNIT-I:

Data types and number System , Binary number system ,Octal & Hexa-decimal number system , I's& 2's complement ,Binary Fixed –point Representation , Arithmetic operation on Binary number , Overflow & underflow ,Floating Point Representation , codes ,ASCII, EBCDIC codes , Gray code , Gray code ,Excess -3& BCD, Error detection & correction codes.

UNIT-II:

Logic Gate , AND , OR NOT gates and their truth tables , NOR, NAND & XOR gate , Boolean Algebra , basic Boolean law's , Demorgan's theorem , MAP simplification , Minimization technique , K-Map , sum of product & product of sum.

UNIT-III:

Combination & Sequential circuit , half adder & full adder , full subtractor, Flip –flops RS, D ,JK, & T flip-flops ,shift register , RAM and ROM , Multiplexer , Demultiplexer , Encoder, Decoder, Idea about Arithmetic Circuit , program control , instruction Sequencing.

UNIT-IV:

I/O Interface , properties of simple I/O devices and their controller, Isolated versus memory-mapped I/O , Mode of Data transfer, Synchronous and Asynchronous data transfer, handshaking, Asynchronous serial transfer , I/O Processor.
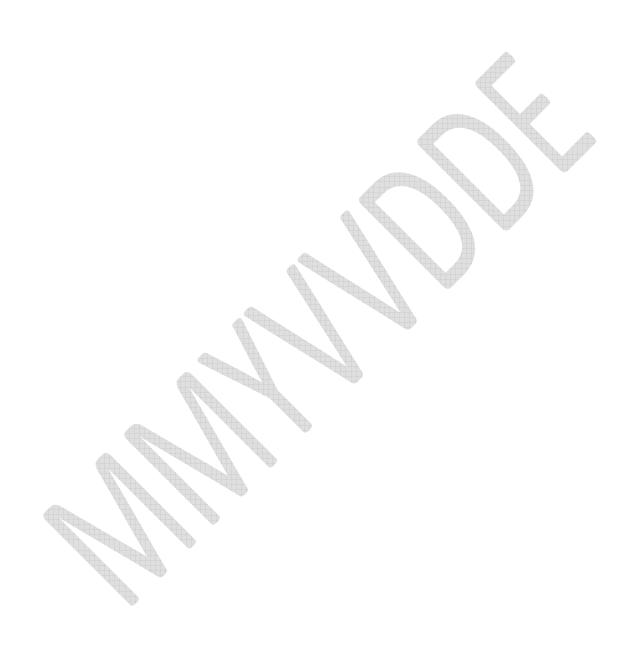
UNIT-V:

Auxiliary memory, magnetic Drum , disk & tape ,semi- conductor memories ,Memory Hierarchy , Associative Memory , Virtual Memory ,Address space & Memory Space , Address mapping page tables , page replacement , cache memory , hit ratio , mapping , hit ratio ,mapping technique, Writing into Cache

Suggested Reading:

Barite." Digital computer fundamental "TMH Publication ISBN 0-07-003899-6

Melvin, "Digital computer Electronic "TMH Publication ISBN 0-07-462235-8

Morris mano," Computer system architecture "PHI publication ISBN 81-203-0417-9

Internet & Web Page Designing

Unit - I

Internet: Evolution, Protocols, Concept, Internet Vs Intranet, growth of Internet, ISP, Connectivity ,Dial-up, leased line, VSAT etc, URls, Domain names, Portals, Application.

E-Mail: Concept, POP and Web Based E-mail, merit, address basics of sending & Receiving, E-mail protocols, mailing list, and free E-mail services.

Unit - II

File transfer Protocols, Telnet & chatting: Data Transmission Protocols, Client /Server Architecture & its Characteristics, FTP & Its usages telnet Concept, Remote Logging, Protocols, Terminal Emulation Massage Board, Internet chatting –voice chat, text chat.

Unit - III

World Wide Web (WWW): History, Working, Web Brower, its function, Concept of Search Engine, Searching the web HTTP, URLS, Web Server, Web Protocols.

Unit - IV

Web Publishing: Concept , Domain name Registration , space on Host Server for web site, HTML, Design tools, HTML editor , Image editor , issues in web site creation & maintenance, FTP software for upload web site.

Unit - V

HTML: Concept of Hypertext , Version of HTML , Element of HTTML, syntax , head & body section Building HTML document , Inserting Text , Image , Hyperlinks , Background and color controls , different HTML tag , Tables , Tables layout and presentation use of size & Attributes , List types and its tags.

Text & Reference Books

1. Level Madul M. 1.2 Internet & Web page Designing by Y.K Jain, BPB Publication
2. Internet for Dummies –Pustak Mahal , New Delhi.
3. Internet & E-commerce A. Mansoor & Dr.Anrag Seetha ,Pragya Publication .

Programming in Visual Basic

Unit-I

Integrated Development Environment of Visual Basic: Integrated Development Environment of VB, User Interface Designing, Basic of Event Driven Programming. From – designing, Showing & hiding.

Unit-II

Visual Basic Language: Data types, variable & Constant, arrays, dynamic array, array as function , collections, procedures, arguments passing , function return values.

Control flow statements: if –then –else, select case, looping statement: Do-loop, for-next, While-Wend, Nested Control Structure, Exit stmt.

Unit-III

Building Blocks of Visual Basic: Basic Active X Control & their Use –Textbox, list box, combo-box, scrollbar, slider & fire controls.

Graphic controls, Image Handling in VB, Coordinate System, Graphic method- Text Drawing, lines& shape, filling shape and grid methods.

Unit-IV

Components of visual Basic: Menu editor: pull down and pop-up menus, Multiple Document interface –parent & Child form & Methods.

Error handing: Types of Error, Error handing method and function.

Unit-V

Database Programming with VB: Database programming with VB-Data Control – method, Properties, Connectivity with database.

Ref. Books:-

Beginner's Guide to V.B. 6 by Reeta Sahoo

V.B. by Pragya Publication

Relational Data Base Management System using Oracle
(RDBMS using Oracle)

UNIT-I:- INTRODUCTION: -Advantages of DBMS approach, various views of data, data independence, Schema & sub-schema, Primary concepts of data models, Database languages, Transaction management, Database administrator & uses, data dictionary, Overall system architecture.
ER MODEL: - Basic concept, Design issues, Mapping constraints, Keys, ER diagram, weak & strong entity sets, specialization & generalization, aggregation, inheritance, design of ER schema, Reduction of ER schema to tables.

UNIT –II: - DOMAIN RELATIONS & KEYS: - Domains, Relations, Kinds of relation, relational databases, various types of keys, candidate, primary, alternate & foreign Keys.
RELATION ALGEBRA & SQL :- The structure, relation algebra with extended operations, Modification of database, idea of relational calculus, Basic structure of SQL, set operation, Aggregate function, Null values, Nested sub queries, Derived relations, views modification of database, Join relations, DDL & SQL .

UNIT– III:- FUNCTIONAL DEPENDENCIES & NORMALIZATION: Base definitions, Trivial & non-Trivial dependencies, Closure set of dependencies & of attributes, Irreducible set of dependencies, introduction to normalization, Non- loss decomposition, FD diagram of I, II & III NF, Dependencies prevention, BCNF, Multi-valued dependencies prevention's, BCNF, Multi-valued dependencies & ANF, Join dependencies & 4 NF. DATABASE INTEGRITY :-General idea, Integrity rules, Domain rules, Attribute rules, Relation rules, Database rule, assertions, triggers, Integrity & SQL.

UNIT- IV: - DISTRIBUTED DATABASES: - Basic idea, distributed data storage, Data replication, Data Fragmentation, horizontal, vertical & mixed fragmentation. EMERGING TRENDS IN DBMS :- Object – Oriented database- Basic idea & the model Object structures Object, Class, inheritance, multiple object identity, Data warehousing terminology, definitions, characteristics, Data mining & its overview, Database on www, multimedia database difference with conventional DBMS, issues, similarity based retrieval continuous media data, multimedia data formats, video servers.

UNIT- V: - NETWORK & HIERARCHICAL MODEL: Basic idea, Data structure diagram, DBTG model, implementation, Tree structure diagram, Implementation techniques, comparison of three models. TRANSACTION CONCURRENCY & RECOVERY:- Basic concept, ACID properties, Transaction state, Implementation of atomicity & durability concurrent executions, Basic idea of serializability, Basic idea of concurrency control, Basic idea of deadlock, Failure classification, storage structure - types, stable storage implementation, data access, Recovery& Atomicity – Log based recovery, deferred database modifications, immediate database modifications, checkpoints.

Text Books:-
1. Henry F.Korth & A. Silbershatz: Data System Concepts. Mc-GrawHill.
2. Arun K. Majumdar & P.Bhattacharya: Data Base Management System. TMH

References Books:-
1. Bipin C. Desai: An Introduction to Database System, Galgotia Pub. Co.Ltd.
2. Jeffrey O. Ullman: Principles of Database Systems, Galgotia Pub. Co.Ltd.
3. James Martin: Principles of Database Management . PHI
4. James Martin, Computer Database organization. PHI

Elementary Mathematics

UNIT-I
Sets and Their Representations. Empty Set, Finite & Infinite Sets, Equal Sets. Subsets. Subsets of the Set of Real Numbers Especially Intervals (with notations). Power Set. Universal Set. Venn Diagrams. Union and Intersection of Sets. Difference of Sets. Complement of a Set. Ordered Pairs, Cartesian Product of Sets. Number of Elements in the Cartesian Product of two Finite Sets. Cartesian Product of the Reals with itself (upto R x R x R). Definition of Relation, Pictorial Diagrams, Domain. Co- domain and Range of a Relation.

UNIT-II
Function as a special kind of relation from one set to another. Pictorial representation of a function, domain, co-domain & range of a function. Real valued function of the real variable, domain and range of these functions, constant, identity, polynomial, rational, modulus, signum and greatest integer functions with their graphs. Sum, difference, product and quotients of functions. Types of relations: reflexive, symmetric, transitive and equivalence relations. One to one and onto functions, composite functions, inverse of a function. Binary operations.

UNIT-III
Complex numbers, Brief description of algebraic properties of complex numbers. Argand plane and polar representation of complex numbers. Statement of Fundamental Theorem of Algebra, solution of quadratic equations in the complex number system. Fundamental principle of counting. Factorial n. (n!),Permutations and combinations,.

UNIT-IV
Sequence and Series. Arithmetic Progression (A.P.). Arithmetic Mean (A.M.) Geometric Progression (G.P.), general term of a G.P sum of n terms of a G.P., geometric mean (G.M.), relation between A.M. and G.M. Sum to n terms of the special series Σn, $\Sigma n2$ and $\Sigma n3$.

UNIT-V
Slope of a line and angle between two lines. Various forms of equations of a line: parallel to axes, point-slope form, slope-intercept form, two point form, intercepts form and normal form. General equation of a line. Distance of a point from a line. Standard equation of a circle, Coordinate axes and coordinate planes in three dimensions. Coordinates of a point.

TEXT & REFERENCE BOOKS:

- *www.e-booksdirectory.com/mathematics*
- *www.origoeducation.com/go-maths.*
- *BASICS OF MATHEMATICS BY R D SHARMA.*

Data and File Structures

Unit – I
Analysis of Algorithms: Mathematical Background, Process of Analysis, Calculation of Storage Complexity, Calculation of Run Time Complexity.

Arrays: Arrays and Pointers, Sparse Matrices, Polynomials, Representation of Arrays, Row Major Representation, Column Major Representation, Applications.

Lists: Abstract Data Type-List, Array Implementation of Lists, Linked Lists-Implementation, Doubly Linked Lists-Implementation, Circularly Linked Lists-Implementation, Applications.

Unit – II
Stacks: Abstract Data Type-Stack, Implementation of Stack, Implementation of Stack using Arrays, Implementation of Stack using Linked Lists, Algorithmic Implementation of Multiple Stacks, Applications.

Queues : Abstract Data Type-Queue, Implementation of Queue, Array Implementation, Linked List Implementation, Implementation of Multiple Queues, Implementation of Circular Queues, Array Implementation, Linked List Implementation of a circular queue, Implementation of DEQUEUE, Array Implementation of a DEQUEUE, Linked List Implementation of a DEQUEUE.

Unit – III
Trees: Abstract Data Type-Tree, Implementation of Tree, Tree Traversals, Binary Trees, Implementation of Binary Tree, Binary Tree Traversals, Recursive Implementation of Binary Tree Traversals, Non Recursive Implementations of Binary Tree Traversals, Applications.

Advanced Trees : Binary Search Trees, Traversing a Binary Search Trees, Insertion of a node into a Binary Search Tree, Deletion of a node from a Binary Search Tree, AVL Trees, Insertion of a node into an AVL Tree, Deletion of a node from and AVL Tree, AVL tree rotations, Applications of AVL Trees, B-Trees, Operations on B-Trees , Applications of B-Trees.

Unit - IV
Graphs : Definitions, Shortest Path Algorithms, Dijkstra's Algorithm, Graphs with Negative Edge costs, Acyclic Graphs, All Pairs Shortest Paths Algorithm, Minimum cost Spanning Trees, Kruskal's Algorithm, Prims's Algorithm, Applications, Breadth First Search , Depth First Search, Finding Strongly Connected Components. **Searching:** Linear Search, Binary Search, Applications.

Unit – V
Sorting: Internal Sorting, Insertion Sort, Bubble Sort, Quick Sort, 2-way Merge Sot, Heap Sort, Sorting on Several Keys.

Advanced Data Structures : Splay Trees, Splaying steps, Splaying Algorithm, Red-Black trees, Properties of a Red Black tree, Insertion into a Red-Black tree, Deletion from a Red-Black tree, AA-Trees.

File Structures : Terminology, File Organisation, Sequential Files, Structure, Operations, Disadvantages, Areas of use, Direct File Organisation, Indexed Sequential File Organisation.

Text Books:-
1. J.P.Trembley & P.G. Sorrenson: An Introduction to Data Structures with Application, Mc-Graw Hill.
2. E.S.Loomis: Data Management and File Processing, P.H.I.
Reference Books-:
1. H.W.Sahnis: Fundamentals of Data Structures, Comp. Sc. Press.
2. D.E.Knuth : The Art of Computer Programing,Addision Wesly.

System Analysis and Design

UNIT-I
The System Concept, Characteristics, Elements and Types of a system, System Development Life Cycle (SDLC) , Considerations for candidate systems and Prototyping. The role of System Analyst.

UNIT-II
System planning and Initial Investigation Information Gathering, information gathering tools. Structured Analysis, The Tools of Structured Analysis (DFD, Data Dictionary, Decision tree and Pseudo Codes Decision Tables), pros and cons of each tool. System performance definition, description of outputs, Feasibility Study Cost/ Benefit Analysis: Data Analysis, Cost/Benefit Analysis, The system proposal.

UNIT-III
The process and Stages of System Design: Design methodologies, development activities. Input design, output design forms design, types of forms, and basics of form design, layout considerations and forms control.

UNIT-IV
File structure, file organization, objectives of database, data structure. System Testing and Quality Assurance, Why system testing, what do we test for, the test plan quality assurance, trends in testing, role of data processing auditor. Training and Documentation.

UNIT-V
Implementing and software maintenance, Conversion, combating, resistance to change, post implementation review, software maintenance. Hardware/Software Selection and the Computer Contract, suppliers, procedure for hardware/software selection, financial considerations in selection, the computer contract. System Security, Disaster Recovery Planning .

TEXT & REFERENCE BOOKS:
- System Analysis and Design, Elias M. Awad ,Galgotia Publications (P) Ltd.
- System Analysis and Design. Interactional Ed. Perry Edward McGraw Hill Publications.
- Information Technology & Computer Applications, by V.K. Kapoor, Sultan Chand & Sons, Delhi.
- System Analysis and Design, A. Mansoor, Pragya Publication.

C++ Programming

UNIT-I

PRINCIPLES OF OBJECT-ORIENTED PROGARAMMING: Object-Oriented Programming Paradigm, Basic Concepts of Object- Oriented Programming, Benefits of OOPs, Object-Oriented Languages, Applications of OOP, C++ Statements, Class, Structure of C++, Program, Creating the Source File, Compiling and Linking.

UNIT-II

TOKENS, EXPRESSIONS AND CONTROL STRUCTURES: Introduction Tokens, Keywords, Identifiers, Basic Data types, User Defined Data Types, Derived Data Types, Symbolic Constants, Type Compatibility, Declaration of Variables, Dynamic Initialization of Variables, Reference Variables, Operators in C++, Scope Resolution Operator, Member Dereferencing Operators, Manipulators, Type Cast Operator, Expressions and Implicit Conversions, Operator Precedence, Control Structures.

UNIT-III

CLASSES AND OBJECTS: Specifying a class, Defining Member Function, making an Outside Function Inline, Nesting of Member function, private member function, Arrays within a class, Memory Allocation for Objects, Static Data Member, Static Member Functions, Arrays of Objects, Object as Function Arguments.

CONSTRUCTORS AND DESTRUCTORS: Introduction, Constructors, parameterized Constructors, Multiple Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructors, Dynamic Constructors and Destructor.

UNIT-IV

FUNCTIONS IN C++: The Main Function, Function Prototyping, call by Reference, Return by reference, Inline Functions, Default Argument, Const. Arguments ,Function Overloading, Friend and Virtual Function.

OPERATOR OVERLOADING AND TYPE CONVERSIONS: Introduction, Defining Operator Overloading, Overloading Unary Operators, Overloading Binary Operators Using Friends, Manipulation of strings using operators, Rules for Overloading Operators, Type conversions.

UNIT-V

INHERITANCE: EXTENDING CLASSES: Introduction, Defining Derived Classes, Single Inheritance Making a Private Member Inheritable, Multilevel Inheritance, Multiple Inheritance ,Hierarchical Inheritance, Hybrid Inheritance.

POINTERS. VIRTUAL FUNCTIONS AND POLYYMORPHISM: Compile time Polymorphism, run time polymorphism, Pointers to Objects, This Pointer, Pointers to Derived Classes, Virtual Functions, Pure Virtual Functions.

STREAMS AND FILES: Stream Classes, Types of I/O, Formatting Outputs, File Pointers, Buffer.
TEMPLATES AND STL: Function and Class Templates, Use of Templates, Standard Template Library.
EXCEPTION HANDLING: Exceptions in C++ Programs, Try and Catch Expressions, Exceptions with arguments.

TEXT & REFERENCE BOOKS:

1. Object Oriented Programming with C++ by E. Balaguruswami. TMH Publications
2. Object Oriented Programming in C++ by Nabajyoti Barakati SAMS PHI Pvt. Ltd.
3. Insights into OOPS & C++. Rajeshwar Shukla, Pragya Publications .

Discrete Mathematics

UNIT-I:

Sets & Preposition –Introduction, combinations of sets, finite and infinite set, unacceptable indefinite sets, principle of inclusion , preposition. Relation and function introduction , a relation models for database . Properties of binary relation .Equivalence relation and lattices , partial ordering relation and lattices . Chain and anti-chain, a job scheduling problem and the pigeonhole principle.

UNIT-II:

Recurrence relation and recursive algorithm – Introduction, Recurrence, relation linear recurrence with coefficients solution, particular solutions, total solutions.

UNIT-III:

Group and ring –group and subgroup , generator and Evaluation of power , Cosets and Lagrange theorem, Permutation , groups and codes , Isomorphism and automorphism , Homomorphism and Normal group , Rings , Integral Domains and Field , Polynomial ring and cyclic codes.

UNIT-IV:

Boolean algebra lattices and algebraic system , principle of duality , basic properties of algebra's of system , defined by lattices , Distributive and complemented lattices , Boolean lattices and Boolean algebra's. Uniqueness finite Boolean algebra's. Boolean function and Boolean Expression, Prepositional Calculus.

UNIT-V:

Finite state machine –introduction, finite state machines, finite state machine as model of physical system, Equivalent machine, finite state Machine as language Recognizer.

Books : Discrete Mathematics By Pragya Publication

Communicative English

UNIT - I
Sentences: Simple, Compound, Complex, Assertive, Interrogative, Imperative, Exclamatory.
Clauses : Co-ordinate, Sub-ordinate, Relative, Adverb, Comparative (Adverb + Adjective)
Articles : usage of 'A', 'An', 'THE' Preposition : Position of Prepositions, Place Relations Time Relations and other relations.

UNIT-II
Functional Grammar
Tenses : Simple Present, Progressive Perfect, Present Perfect Progressive along with Past Tense and indications of futurity. Reported speech Modals : Will, Shall Should, Would and others Voice - Active and Passive.

UNIT - I
Nouns : Countable, Unconuntable, Pronoun : Personal, Relative and others, Verb and Verb structures (infinitives and gerundials),Linking Devices.

Adverbs and adverb phrases, Comparisons and Intensification Modifiers and adverbs, Adjectives and Adjective Phrases.

UNIT - III
Synonyms Antonyms & Homonyms, Diminutives and Derivatives, Jargons or Registers.

UNIT - IV
Precis writing, Paragraph, Curriculum Vitae/Resume, Curriculum Vitae/Resume, Preparation of questionnaire for Interview skills.

Effective Public Speaking: Features & aspects of EPS, general mistakes & how to avoid them, structure of an ideal speech/technical presentation.

Object Oriented Technology and Java Programming

UNIT – I Object Oriented Technology and Java

Object Oriented Methodology : Paradigms of Programming Languages, Evolution of OO Methodology, Basic Concepts of OO Approach, Comparison of Object Oriented and Procedure Oriented Approaches, Benefits of OOPs, Introduction to Common OO Language, Applications of OOPs.

Java Language Basics : Introduction To Java, Basic Features, Java Virtual Machine Concepts, A Simple Java Program, Primitive Data Type And Variables, Java Keywords, Integer and Floating Point Data Type, Character and Boolean Types, Declaring and Initialization Variables, Java Operators.

Expressions, Statements and Arrays: Expressions, Statements, Control Statements, Selection Statements, Iterative Statements, Jump Statements, Arrays.

UNIT – II Object Oriented Concepts

Class and Objects : Class Fundamentals, Creating objects, Assigning object reference variables, Introducing Methods, Static methods, Constructors, Overloading constructors, This Keyword, Using Objects as Parameters, Argument passing, Returning objects, Method Overloading, Garbage Collection, The Finalize ( ) Method.

Inheritance and Polymorphism : Inheritance Basics, Access Control, Multilevel Inheritance, Method Overriding, Abstract Classes, Polymorphism, Final Keyword. Abstraction and Encapsulation.

Packages and Interfaces : Package, Defining Package, CLASSPATH, Package naming, Accessibility of Packages, Using Package Members, Interfaces, Implementing Interfaces, Interface and Abstract Classes, Extends and Implements Together**.**

UNIT – III Exceptions Handling and Multithreading

Exceptions Handling: Exception, Handling of Exception, Using try-catch, Catching Multiple Exceptions, Using finally clause, Types of Exceptions, Throwing Exceptions, Writing Exception Subclasses.

Multithreaded Programming : Multithreading: An Introduction, The Main Thread, Java Thread Model, Thread Priorities, Synchronization in Java, Inter thread Communication.

UNIT – IV I/O and String Handling

I/O in Java : I/O Basics, Streams and Stream Classes, Byte Stream Classes, Character Stream Classes, The Predefined Streams, Reading from, and Writing to, Console, Reading and Writing Files, The Transient and Volatile Modifiers, Using Instance of Native Methods.

Strings and Characters : Fundamentals of Characters and Strings, The String Class, String Operations, Data Conversion using Value Of ( ) Methods, String Buffer Class and Methods.

Exploring Java I/O : Java I/O Classes and Interfaces, I/O Stream Classes, Input and Output Stream, Input Stream and Output Stream Hierarchy, Text Streams, Stream Tokenizer, Serialization, Buffered Stream, Print Stream, Random Access File.

UNIT – V Applets Programming and Advance Java Concepts

Applets : The Applet Class, Applet Architecture, An Applet Skeleton: Initialization and Termination, Handling Events, HTML Applet Tag.

Graphics and User Interfaces : Graphics Contexts and Graphics Objects, Color Control, Fonts, Coordinate System, User Interface Components, Building User Interface with AWT, Swing-based GUI, Layouts and Layout Manager, Container.

Networking Features : Socket Overview, Reserved Parts and Proxy Servers, Internet Addressing: Domain Naming Services (DNS), JAVA and the net: URL, TCP/IP Sockets, Datagrams.

Advance Java : Java Database Connectivity, Establishing A Connection, Transactions with Database, An Overview of RMI Applications, Remote Classes and Interfaces, RMI Architecture, RMI Object Hierarchy, Security, Java Servlets, Servlet Life Cycle, Get and Post Methods, Session Handling, Java Beans.

Fundamentals of Computer Network

UNIT – I Concepts of Communication and Networking

Basics of Data Communication : Concept of communication system, Analog and Digital Communication, Data communication modes, Synchronous and asynchronous transmission, Simplex, half-duplex, full duplex communication, Networking Protocols and Standards, Layering, OSI reference model, encapsulation, End-to-end argument. Protocol design issues, Applications.

Modulation and Encoding: Analog Modulation (AM, FM, PM), AM Demodulation (one technique only), Advantages and Disadvantages of each., Analog to Digital (Digitization), Sampling, Quantization, Digital to Analog, Digital Modulation (ASK, FSK, PSK, QPSK).

Multiplexing and Switching: Concept, FDM, TDM, SDM, Multiplexing Applications, Circuit and Packet Switching.

Communication Mediums : Digital data transmission, Serial and Parallel Transmission, Guided and Unguided mediums, Wireless Communication, Coaxial Cables, Twisted Pair Cables, Fiber Optic Cables, Connectors.

UNIT – II Networks and Devices

Network Classifications and Topologies : Network Concept, LAN overview, LAN Topologies, LAN access methods, Network Types based on size like PAN, LAN, MAN, WAN, Functional Classification of Networks, Peer to Peer, Client Server. Wide Area Network, WAN Topologies, WAN Access Methods.

OSI and TCP/IP Models: Introduction of OSI Model, Need of such Models, Basic functions of each OSI layer, Introduction to TCP/IP, Comparisons with TCP/IP layers.

Physical and Data link Layer: Error detection and correction, CRC, Framing, Retransmission strategies, Multi-access communication, CSMA/CD, Ethernet, Addressing, ARP and RARP.

Internetworking Devices: Network Interface Cards, Modems, Repeaters, Hubs, Bridges, Switch (L2 and L3 differences) and gateways.

UNIT – III Network and Transport Layer

Network layer: Circuit and packet switching, Routing, Congestion control, Routing protocols: distance vector vs link-state routing, DV problems, Network Addressing, Forwarding, Fragmentation, Error Messaging Services.

Transport layer: Addressing and multiplexing, Flow control, congestion control, data transport, Port numbers, service models, Intro to reliability, QoS.

UNIT – IV Application Layer and Network Application
Application Layer: DNS, Remote Logging, File transfer, Network Management, client-server applications, WWW, E-mail, MIME.

Network Applications: Internet Applications like emails, chatting, social networking, Rail Reservations, Information Sharing, e-governance, Online Processing and Collaborations, etc., Mobile Applications.

UNIT – V Network Design and Security
Building a Simple Network: Examples of designing the developing small networks, Structure Cabling, Integrating home computers and devices, creating a small Networking.

Introduction to Network Architectures: X.25, Frame relay, Telephone network, ATM network, ISP, IPv4 and IPv6 overview 42

Introduction to Wireless and Mobile Networks: Introduction to wireless communication systems, modern wireless communication systems and generations, Introduction to cellular mobile systems, CDMA, cellular system design fundamentals.

Network Security: Introduction to computer security, Security services, Authentication and Privacy, Block and Stream Ciphers, Public and Private key Cryptography, Introduction to RSA, MD5 and DES at the beginner's level.

Analysis and Design of Algorithms

UNIT – I
Basics of an Algorithm : Definition and Example of an algorithm, Characteristics of an algorithm, Steps in Designing of Algorithms, Growth of function, Recurrence, Problem Formulation (Tower of Hanoi), Substitution Method, Iteration Method, Master Method.
Asymptotic Bounds: Asymptotic Notations, Concept of efficiency of analysis of an algorithm Comparative efficiencies of algorithms: Linear, Quadratic, Polynomial and Exponential.

UNIT – II
Analysis of simple Algorithms: Euclid's algorithm for GCD, Horner's Rule for polynomial evaluation, Simple Matrix (n x n) Multiplication, Exponent evaluation e.g. a_n, Searching, Linear Search, Sorting, Bubble sort, Insertion Sort, Selection sort.

UNIT – III
Greedy Technique: Elements of Greedy strategy, Activity Selection Problem, Continuous Knapsack Problem, Coin changing Problem and Examples.

UNIT – IV
Divide and Conquer Approach: General Issues in Divide and Conquer, Binary Search, Merge Sort, Quick Sort, Integer Multiplication and Examples.

UNIT – V
Graph Algorithm: Representation of Graphs, Adjacency Matrix, Adjacency List, Depth First Search and Examples, Breadth First Search and Examples.

Advance Calculus & Matrices

UNIT-I

Derivative as Tangent to a curve, Continuity and differentiability, limit and derivative , derivative of products and composite function , Leibnitz rule and chain rule.

UNIT-II

Expansion of function by Maclaurins's theorem, Taylor's theorem, partial differentiation, total differentiation coefficient, Homogeneous Function, Euler theorem.

UNIT-III

Integral as anti- derivative , integration by part , change of variable , integration of rational and irrational function , definite integral , definite integral as a limit of a sum , application of definite integral to find sum of infinite series.

UNIT-IV

Differential Equation : solution of ordinary differentiation equations ,solution of first order and first degree differential equation , first order and higher degree differential equation, linear differential equation of second order.

UNIT-V

Matrix: Solution of system of linear equation using matrix method , rank of matrix , consistency of the linear system , Eigen value and Eigen vectors.

Books: Advance Calculus & Matrices By Pragya Publication

Communicative Hindi

यूनिट–1

हिन्दी भाषा का संक्षिप्त विकास, हिन्दी के लिपि एवं बोलियों का संक्षिप्त परिचय, शब्दकोश – उपयोग एवं महत्व , हिन्दी व्याकरण, शब्द रचना, वाक्य रचना, वाक्यों के प्रकार, उपवाक्य संधि समास, उपसर्ग, प्रत्यय, प्र्यायवाची विलोमार्थी अनेकार्थक, समूहार्थक शब्द ।

यूनिट–2

देवनागरी लिपि के मुख्य विशेषताऐं वर्तनी, शब्द शुद्धि एवं वाक्य शुद्धि के नियम, प्रमुख मुहावरो एवं लोकोक्तियों का प्रयोग, छंद एवं अलंकारों का उपयोग, विराम चिन्हों का उपयोग।

यूनिट–3

गद्य को विभिन्न शैलियॉ, साहित्य एवं समाचार पत्रों की भाषा शैली, वर्ण विभाग, स्वर व्यंजन , शब्द विभाग :– संजा, सर्वनाम, विश्लेषण किया, संबंध बोधक समुच्चय बोधक, विस्मयिय बोधक । वाक्य विभाग :– उद्देशय और विधेय, काल और काल अभेद पुरूष, वचन, लिंग ।

यूनिट–4

अनुवाद का अर्थ और परिभाषा, अनुवाद के प्रकार, अनुवाद के उपकरण एवं समस्या, भाव तथा प्रभाव के आधार पर अनुवाद एवं लेख।

यूनिट–5

निबंध लेखन, रिपोर्ट लेखन, पत्र लेखन, अनुवाद, गोदान ,गवन . मुंशीप्रेमचंद।

TEXT & REFERENCE BOOKS:

- अनुवाद विकास एवं संपेषण :– डॉ. हरिमोहन
- अनुवाद कला सिद्धांत और प्रयोग :– डॉ कैलाश भाटिया
- व्यवहारिक हिन्दी :– डॉ. माखेन्द्र पाठक
- परिष्कृत हिन्दी व्याकरण :– बदरीनाथ

Introduction to Software Engineering

UNIT –1

INTRODUCTION TO SOFTWARE ENGINEERING: Introduction of software- The evolving role of software-Software characteristic-Types of software-Software application-What is software engineering-Software engineering concepts -What does software engineering involve-Importance of software engineering-Principles of software engineering.

SOFTWARE ENGINEERING APPROACHES, PROBLEMS, CRISIS AND MYTHS: Software engineering approach-Software engineering problem-Causes of the problem Software crisis-Software myths-Management Myths-Customer Myths-Practitioner's Myths Bringing formality to the software development process.

UNIT-2

THE PROCESS, DESIGN CONCEPTS AND MODELS: Software process-Characteristics of software process-Software process, projects & products Design concept and modeling-Concepts-Design Objectives-Design Principles-Software.

ENGINEERING PROCESS MODELS: Waterfall Model **-** It's Advantages and Limitations-Prototype Model-It's Advantages and Limitations-Prototype's effect on software development cost Iterative Enhancement Model-Spiral Model-COCOMO Model.

UNIT- 3

PROJECT SCHEDULING AND TRACING: Software project planning-Estimation of a project - Cost estimation-Building cost estimation – models-Process-based estimation-Project scheduling and tracing-Design tools and techniques-Structure charts-Gantt charts -Activity networks -Structured design methodology-Identify the input and output data elements.

RISK ANALYSIS: Software project planning. Introduction to risk analysis. Risk assessment-Risk evaluation Risk management.

SOFTWARE METRICS: Project management concept-Software project metrics-Software metrics - Software metrics type-Software metrics steps-Software metrics rules-Software metrics objective.

UNIT –4

SOFTWARE QUALITY: Introduction of software quality-Factors of software quality-Software quality assurance Activities-Formal technical review -Phases of ftr-Software configuration management.

COUPLING AND COHESION: Introduction to Coupling-Definition-Factors affecting coupling-Introduction to Cohesion Levels of cohesion-Coincidental-Logical cohesion-Temporal cohesion-Procedural cohesion Communicational cohesion-Sequential cohesion-Functional cohesion.

CODING: Introduction - Programming practice – Top - down and bottom – up - Structured programming Hiding information-Verification & validation-Good coding style.

UNIT-5

SOFTWARE TESTING STRATEGIES: Strategic approach to software testing-Unit testing-Integration testing-Validation testing System testing-The art of debugging.

MAINTENANCE: Introduction- Categories of maintenance- Corrective maintenance- Adaptive maintenance Perfective maintenance-Maintenance characteristic -Structured versus unstructured - maintenance- Maintenance tasks- A maintenance organization- Flow of events-Maintenance side effects-Coding side effects-Data side effects-Documentation side effects-Maintaining "alien code".

Introduction to Operating System

Unit - I
Introduction to Operating Systems: What is an Operating System? Evolution of Operating Systems, Operating System Structure, Different Views of the Operating System, Design and Implementation of Operating Systems. **The Concept of Process** :Process, Implicit and Explicit Tasking, Process Relationship, Process State, Process. Control Block, Process Scheduling, Context Switch, Operations on Process, Operating-System Services for Process Management, Threads, Interprocess Communication.

Unit – II
CPU Scheduling: Basic Concepts, CPU-I/O Burst Cycle, Scheduling, Types of Schedulers, Dispatcher, Scheduling Criteria, Multiple -level Scheduling, Real-Time Scheduling, Algorithm Evaluation, **Process Synchronization** : The Critical-section Problem, Synchronization Hardware**,** Semaphores, Classical Problems of Synchronization, Critical Region, Monitors, Atomic Transactions.

Deadlocks, System Model, Deadlock Characterization, Methods For Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Dead lock Detection, Recovery from Deadlock, **Memory Management**, Background, Logical Versus Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation, **Virtual Memory**: Background, Demand Paging, Performance of Demand Paging, Page Replacement, Page Replacement Algorithms.

Unit – III
File Systems, Files, Directories, File System Implementation, **Security and Protection**, Security Threats and Goals, Penetration Attempts, Security Policies and Mechanisms, Authentication, Protection and Access control, Cryptography

Multiprocessor Systems, Background, Motivation and Classification, Multiprocessor Interconnections, Types of Multiprocessor Operating Systems, Multiprocessor OS Functions and Requirements, Introduction to Parallel Programming, Multiprocessor Synchronization, **Network Structures,** Background, Motivation, Topology, Network Types.

Unit – IV
Distributed System Structure, Background, Motivation, Topology, Network Types, Communication, Design Strategies, **Distributed File Systems**, Background, Naming and Transparency, Remote File Access, File Replication, **Distributed Coordination**, Event Ordering, Mutual Exclusion, Atomicity, Deadlock Handling, Performance Measurement, Monitoring and Evaluation, Background, Need for Performance Monitoring and Evaluation, Performance Measures, **Performance Evaluation Techniques**, Bottlenecks and Saturation

Unit – V
Introduction to Linux Operating System: Features of Linux, Drawbacks of Linux, Components of Linux, Memory Management Subsystems, Linux Process and Thread Management, File Management System, Device Drivers.
Linux Commands and Utilities: Entering the Machine, User Names and Groups, Logging In, Correcting Typing Mistakes, Format of Linux Commands, Changing Your Password, Characters

with Special Meanings, Linux Documentation, The File System, Current Directory, Looking at the Directory Contents, Absolute and Relative Pathnames, Some Linux Directories and Files.
Linux Utilities and Editor: Some Useful Commands, Permission Modes and Standard Files, Pipes, Filters and Redirection, Shell Scripts, Graphical User Interface, Editor.
User-to-User Communication: On-Line Communication, Off-Line Communication, Apache Server Settings, Network Server Settings, Domain Name Server, Network File Server.
UNIX System Administration: System Administration, Installing Linux, Choosing an Installation Method, Choosing an Installation Class, Pre-installation checks, Installation, Booting the System, Maintaining User Accounts, File Systems and Special Files, Backups and Restoration.

Text Books :-
1. Operating System Concept (IVth ed.) by Silbersantz and Galvin (Addition Wesly)
Reference Books :-
1. Operating system Principles By P. B. Hansen, P.H.I.
2. An introduction to operating system design N. Haberman, Galgotia publication

Social Science

UNIT- I

Concept, Definitions and Importance of Sociology, Relation of Sociology with Other Social Sciences, Group-Community-Institution-Organisation-Society-Humanity-Biosphere and Their Unity and Inter-Dependence, Meaning of Family, Kinship, Class, Caste, Clan, Tribe, Marriage.

Concept of Socialization, Social Stratification, Concept, Definitions and Process of Social Change, Understanding of Contemporary Changes in India , Characteristics of Indian Culture.

Concept, Definitions and Importance of Psychology, Relation of Psychology with Other Social Sciences, Psychology of Social Groups , Elements and Process of Human Behavior, Theory of Information Opinion and Attitude Formation.

UNIT- II

Environmental Study, Renewable and Non-Renewable Resources
Natural Resources and Associated Problems:

(a) Forest Resources: Use and over-exploitation, Deforestation, Timber extraction, mining, Dams and their effects on forests and tribal people.

(b) Water Resources: Use and over-utilization of surface and ground water, floods, Drought, dams-benefits and problems.

(c) Mineral Resources: Use and exploitation, environmental effects of extracting and using mineral resources.

(d) Food Resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity.

(e) Energy Resources: Growing energy needs, Renewable and non-renewable energy sources, Use of alternate energy sources.

(f) Land Resources: Land as a resource, land degradation, Man induced landslides, Soil erosion and Desertification.

UNIT – III

Environmental Study: Role of an Individual in Conservation of Natural Resources. Environmental Pollution – Definition, Causes, Effects And Control Measures of : Air Pollution Water Pollution , Soil Pollution , Marine Pollution, Noise Pollution ,Thermal Pollution ,Nuclear Pollution, Role Of An Individual in Prevention of Pollution Public Awareness, Understanding Ecosystem Environment and Human Health.

Concept, definitions and importance of Political Science, Relations of Political Science with other social sciences, Concepts of power and authority, Basic elements of Indian constitution.

UNIT – IV

Indian Constitution - Historical Background , Constituent Assembly of India – Philosophical foundations of the Indian Constitution ,Preamble , Introduction to Fundamental Rights and Duties ,Citizenship

Constitutional Remedies for citizens. Union Government , Structures of the Union Government and Functions , President , Vice President ,Prime Minister ,Cabinet , Parliament , Supreme Court of India , Governor ,Chief Minister , Cabinet – State Legislature , Judicial System in States , High Courts and other Subordinate Courts.

UNIT – V

Concept, Definitions and importance of Economics, Relations of Economics with other social sciences, Introduction to Indian Economy, Market, Principles of demand and supply, Consumer behavior, Concept of Globalization, Liberalization, Swadeshi.

Human Rights - the Basic concept: Individual, group, State, Civil Society. Liberty,. Freedom, Equality Justice, Violence, Counter Violence, Human Values: Humanity, Compassion, Virtues, Impact of social structure on human behavior, Role of socialization in human values, Modernization.

TEXT & REFERENCE BOOKS:
- A TEXT BOOK OF ENVIRONMENTAL SCIENCE BY ARVIND KUMAR, APH PUBLISHING CORPORATION
- A TEXT BOOK OF ENVIRONMENTAL STUDIES BY DR B K SHARMA , HIMALAY
- FUNDAMENTALS OF SOCIOLOGY BY RAJENDRA KUMAR SHARMA, **ISBN** : 9788171566457
- DURGA DAS BASU, " INTRODUCTION TO THE CONSTITUTION OF INDIA ", PRENTICE HALL OF INDIA, NEWDELHI
- R.C.AGARWAL, "(1997) INDIAN POLITICAL SYSTEM ", S.CHAND AND COMPANY, NEW DELHI.

Statistical Techniques

UNIT – I Statistics and Probability

Descriptive Statistics: Collecting Data, Kinds of Data, Frequency Distribution of a Variable, Graphical Representation of Frequency Distribution, Summarisation of Data, Measures of Central Tendency, Measures of Dispersion or Variability.

Probability Concepts: Preliminaries, Trials, Sample Space, Events, Algebra of Events, Probability Concepts, Probability of an Event, Probability of Compound Events, Conditional Probability and Independent Events.

Probability Distributions : Random Variable, Discrete Random Variable, Continuous Random Variable, Binomial Distribution, Poisson Distribution, Uniform Distribution, Normal Distribution.

UNIT – II Statistical Inference

Sampling Distributions: Population and Samples, What is a Sampling Distribution, t-distribution, Chi-Square distribution F-distribution.

Estimation : Point Estimation, Criteria For a Good Estimator, Interval Estimation, Confidence Interval for Mean with Known Variance, Confidence Interval for Mean with Known Variance, Confidence Interval for Proportion.

Tests of Significance: Some Basic Concepts, Tests About the Mean, Difference in the Means of Two Populations Test About the Variance.

Applications of Chi-Square in Problems with Categorical Data : Goodness-of-fit, Test of Independence.

UNIT – III Applies Statistical Methods - I

Analysis of Variance: One-Way Classification : Analysis of Variance: Basic Concepts, Source of Variance, One-Way Classification Model for One-Way Classification, Test Procedure, Sums of Squares, Preparation of ANOVA Table, Pairwise Comparisons, Unbalanced Data, Random Effects Model.

Regression Analysis: Simple Linear Regression, Measures of Goodness of Fit, Multiple Linear Regression, Preliminaries, Regression with Two Independent Variables.

UNIT – IV Applies Statistical Methods - II

Forecasting and Time Series Analysis : Forecasting, Time Series and Their Components, Long-term Trend, Seasonal Variations, Cyclic Variations, Random Variations/Irregular Fluctuations, Forecasting Models, the Additive Model, the Multiplicative Model, Forecasting Long-term Trends, The Methods of Least Squares, the Methods of Moving Averages, Exponential Smoothing.

Statistical Quality Control : Concept of Quality, Nature of Quality Control, Statistical Process Control, Concepts of Variation, Control Charts, Control Charts For Variables, Process Capability Analysis, Control Charts For Attributes, Acceptance Sampling, Sampling Plan Concepts, Single Sampling Plans.

UNIT – V Sampling

Simple Random Sampling and Systematic Sampling : Sampling- What and Why? Preliminaries, Simple Random Sampling, Estimation of Population Parameters Systematic Sampling, Linear Systematic Sampling, Circular Systematic Sampling, Advantages and, Limitations of Systematic Sampling.

Stratified Sampling: Stratified Sampling, Preliminaries, Advantages, Estimation of population parameters, Allocation of sample size, Construction of strata, Post-Stratification.

Cluster Sampling and Multistage Sampling : Cluster Sampling, Preliminaries, Estimation of population mean, Efficiency of cluster sampling Multistage sampling, Preliminaries, Estimation of mean in two stage sampling.

Principles of Management and Business Communication

UNIT-I
Management basics, what is management, the history of management, Types of manager, manager qualities. Management responsibilities, management tasks and functions. The business environment defining the organization, organization structure, the quality organization, organizational changes, Centralization and Decentralization, managing changes. Management obligations, social and professional responsibilities, government regulations.

Strategy formulation the elements of strategy, the strategy formulation process, alliances and acquisitions, strategy formulation tools and Techniques, plan implementation. Decision making the nature of management decision, the decision making Process, decision making techniques.

UNIT – II
Information presentation and reporting - Principle, Type of Reports, Presentation on Modes, Function reporting system, Information and its uses, Characteristics of information, flow of information. Brief introduction to project planning and management and its tools/ techniques- Gantt chart, PERT/CPM. Human Resources management: Concepts & functions, Job analysis and role description.

UNIT – III
Management skills: Leadership and motivation The nature of leadership, leadership theories, Delegation, motivation and motivation theories, need of motivation, motivation techniques. Team building Defining and effective team, selecting team members, building teams, training and development. Effective communication The communication process, presentation skills Tools and techniques.

Time management The importance of time, characteristics of management Tasks, determining time elements, time management techniques. Entrepreneurship Entrepreneur and its role, how to become an Entrepreneur, essentials steps to become an entrepreneur, EDP training.

Unit – IV
Greetings & Introductions : Small talk, Corporate Entertainment. Company Profiles/Jobs & responsibilities. **Getting Ready for the Job Market:** Preparing a Portfolio. **Responding to Advertisements:** Writing a CV/Resume, Covering Letter, Accepting & Declining Job Offers. **Interviews:** Preparing for Interviews, Face to face Interviews, Phone & walk in Interviews Group Discussions, Presentations for Recruitment.

UNIT - V
Communicating Across Cultures: Language & Culture, Business Travel, Business Events – IT Trade Fairs & Conferences. **Features of Written & Oral Communication:** Making a choice, In Company Communication: notices, notes, messages, memos, emails etc. **External Communication:** Types of Letters, faxes, e mails, Conventions & Practices. **Writing Reports:** Types of reports – Informative & analytical, Contents & Structures. **Writing Proposals:** Basic Features, Types of proposals.

The Process of Writing: Editing Skills – correction of errors, eliminating superfluities, Summarizing.

TEXT & REFERENCE BOOKS:
- S.K. BASANDRA, "COMPUTERS TODAY", GALGOTIA PUBLICATIONS
- MAZDA, ENGINEERING MANAGEMENT, ADDISEN WESLEY
- KOONTZ H, "ESSENTIALS OF MANAGEMENT", TMH PUBLICATIONS

Science of Communication and E - Commerce

UNIT- 1

Introduction to communication theory, the fact of communication, Communication -Definition, Nature, Scope, Purpose. Process of Communication. Functions of Communication, Uses of Communication, The needs of communication, Communication and information, Communication and Languages.

Definition and elements of human communication, Socialization and role of communication in Socialization Types of communication, Intrapersonal communication, Interpersonal communication, Focused and unfocused interactions, group communication, mass communication, Interactive communication ,Public Communication ,Corporate communication.

UNIT- II

Verbal communication, Non verbal communication, Importance of body language, Appropriate Body Postures ,Oral communication, Written communication, Visual communication, Signs ,Symbols and code system, communication skills , Dress code .

Barriers of communication, Physical barriers of communication, Psychological barriers of communication, Linguistic and cultural barriers of communication, Mechanical barriers of communication, Removal of barriers.

UNIT- III

Group communication: Types of Group discussion, Theories and Models, Decision making process, Leadership, Team work communication, Leadership skill Development, Group Discussion, Written Communication skills.

Introduction to E-Commerce: Definition and scope of E-Commerce and M-Commerce, E-Commerce trade cycle, Electronic Markets, Internet Commerce, Benefits and Impacts of E-Commerce.
Elements of E-Commerce: Various elements, e-visibility, e-shops, Delivery of goods and services, Online payments, After - sales services, Internet E-Commerce security.

UNIT – IV

EDI and Electronic Payment Systems: Introduction and definition of EDI, EDI layered Architecture, EDI technology and standards, EDI communications and transactions, Benefits and applications of EDI with example, Electronic Payment Systems: credit/debit/smart cards, e-credit accounts, e-money.

Introduction to EC models: Inter-organization and intra-organization E-Commerce, E-Commerce Models: B2B, B2C, C2B, C2C, G2C, C2G.

E-Business: Introduction to Internet bookshops, Grocery Suppliers, Software Supplies and support, Electronic newspapers, Virtual auctions, Online share dealing, e-diversity.

UNIT – V

E-Security and Legal Issues: Security concerns in E-Commerce, Privacy, integrity, authenticity, non-repudiation, confidentiality, SSL, Digital Signatures and fire walls, IT Act 2000,Cyber crimes and cyber laws.

Mobile Commerce and Future of E-Commerce: Introduction to Mobile Commerce, Benefits of Mobile Commerce, Impediments of M-Commerce, M-Commerce framework, Emerging and future trends. Case Study.

TEXT & REFERENCE BOOKS:

• MASS COMMUNICATION IN INDIA BY KEVAL J. KUMAR - A JAICO BOOK
• COMMUNICATION MOSAICS: AN INTRODUCTIONTO THE FIELD OF COMMUNICATION, 2001. BY WOOD, JULIA T, WADSWORTH
• FRONTIERS OF ELECTRONIC COMMERCE, BY- KALAKOTA, RAVI; STONE, TOM; WHINSTON, ANDREW B, ADDISON WESLEY PUBLISHING CO, ISBN 8178080575
• E-COMMERCE AN INDIAN PERSPECTIVE BY P. TJOSEPH, S.J. PRENTICE-HALL OF INDIA

Network Programming and Administration

UNIT – I
Introduction to TCP/IP : Origin of TCP/IP and Internet, Communication ,Why do we Need the Internet, Need of Protocol on Communication, Problems in Computer Communication, Dealing with Incompatibility, A Brief History of the Internet, Architecture of the Internet, TCP/IP Layer and Protocols, Network Access Layer, Internet Layer, Need for IP Address, Classes of IP Address, Special Meanings, Who Decides the IP Addresses, Internet Protocol, Address Resolution Protocol (ARP),Reverse Address Resolution Protocol (RARP), Internet Control Message Protocol (ICMP), Transport Layer, Transmission Control Protocol, User Datagram Protocol (UDP), Application Layer, Electronic Mail, Domain Name System (DNS), How does the DNS Server Works? Simple Network Management Protocol (SNMP), Remote Login: TELNET, World Wide Web: HTTP, Networking Example.

UNIT – II
Internet Protocol : Overview of Internet Protocol, IP Header, IP Address, IP Address Classes, Subnet Masks and CIDR Networks (Classless IP Addresses), Internet-Legal Versus Private Addressing, IP Routing, Routing Protocol, Routing Algorithms.
Transport Layer Protocols: Overview of TCP, Transmission Control Protocol (TCP), TCP Header, TCP Connection Establishment and Termination, TCP Connection Establishment, TCP Connection Termination, User Datagram Protocol (UDP).

UNIT – III
Application Layer Protocols : Domain Name System (DNS), Hierarchical Name Space, Domain Servers, How does DNS Work in Internet, Domain Name Resolution, Messages Used in DNS, Dynamic DNS (DDNS), Electronic Mail, Simple Mail Transfer Protocol (SMTP),Message TransferAgent, UserAgent, Post Office Protocol (POP), Internet Mail Access Protocol (IMAP),Multipurpose Internet Mail Extension (MIME), Telnet , File Transfer Protocol (FTP).

UNIT – IV
TCP/IP Programming Concepts: Client Server Communication, Designing Client/Server Programs, Socket Concepts, IP Address and Ports, Byte Ordering, Sketch of Networking Connection, Active and Passive Sockets, Socket Fundamentals, Networking Example.
Socket Interface : Elementary Socket System Calls, Socket System Call, Bind System Call, Connect System Call, Listen System Call, Accept System Call, Elementary Data Transfer Calls, Closing a Socket, TCP and UDP Architectures, Networking Example.
Socket Programming: Advance System call, Data Transfer, Byte Operations and Addressing, Socket Options, Select System Call Raw Socket, Multiple Recipients, Uni casting, Broadcasting, Multicasting, Quality of Service Issues.
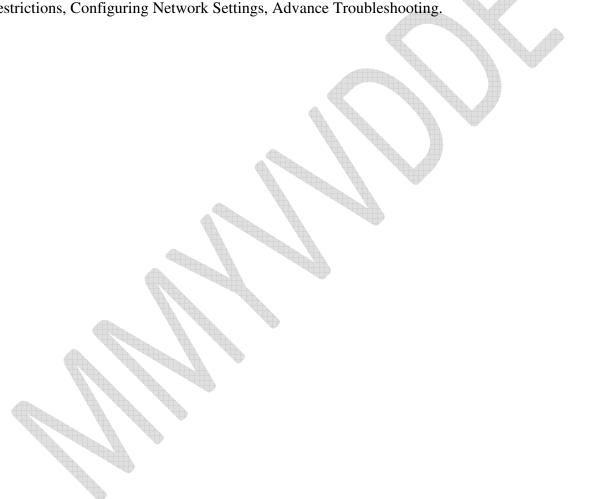
UNIT – V

Introduction To Network Administration : Role and responsibilities of Network Administrator, Linux and TCP/IP Internetworking concepts, Using Network Clients, Understanding System Initialization, Use Remote Administration Services and Tools.

Network Administration Activities: Managing software packages and File systems, Managing users, System and kernel management, Basic Troubleshooting.

Network Configuration and Setting: Configuring Networks, Dynamic Host Configuration Protocol, Domain Name System (DNS), Network File System (NFS), Web Server (Prefer Samba Server).

Network Management and Security: Networks and Security, User Security Management, Disk Security Management, Security Configuration and Analysis, Account Policies, Permissions and Restrictions, Configuring Network Settings, Advance Troubleshooting.

Web Programming and Web Development

Unit - I
Web 2.0 and XHTML: What Is Web 2.0? Introduction to Web 2.0 terms: Search, Content Networks, Blogging, Social Networking, Social Media, Rich Internet Applications (RIAs), Web Services, Mashups, Widgets and Gadgets, Introduction to XHTML and WML, Syntactic Differences between HTML and XHTML, Standard XHTML Document Structure, An example of XHTML covering Basic Syntax, Images, Hypertext Links, Lists and Tables, Creation of an XHTML Form, Internal Linking and Meta Elements.

Using Style Sheets : CSS: Inline Styles, Embedded Style Sheets, Linking External Style Sheets, Style Specification Formats Selector Forms, Colour, Property Value Forms, Font Properties, List Properties, Alignment of Text, The Box Model, Background Image ,The <span> and <div> Tags.

Introduction to XML: XML Basics, XML Document Structure, XML Namespaces, Document Type Definitions, XML Schemas, Displaying XML Documents.

Unit - II
Programming with Java Script – DOM and Events : The Document Object Model, Element Access in JavaScript, Traversing and Modifying a DOM Tree, DOM Collections and Styles, Events, Examples of Event Handling from Body, Button, Text Box and Password Elements, Dynamic Documents using JavaScript – element moving, visibility, positioning etc., Example program(s),Introduction and example of AJAX.

Introduction to WAP and WML: WAP and WML Basics, WML formatting and links, WML input, WML tasks, WML timer, WML variables, Example.

The Server Side Scripting : Server side scripting and its need ,Two-Tier, Three-Tier, N-Tier and Enterprise Architecture, Various Languages/ Technologies for server scripting ,HTTP Methods (such as GET, POST, HEAD, and so on) , Purpose ,Technical characteristics, Method selection, Use of request and response primitives, Web container – Tomcat.

Unit - III
JSP – Basic: Basic JSP Lifecycle, JSP Directives and Elements, Scriptlets, Expressions, Action Elements, Standard Actions, Comments and Template Data, JSP variables, The out Object, Request, response, sessions and application objects.

JSP – Applications: Exceptions and exception handling using JSP, Cookies and sessions, Managing Email using JSP.

JSP Application Development: Example applications using JSP, What is JDBC? Need for JDBC, Database Drivers, Connection using JDBC API, Application development and deployment.

Introduction to PHP, History of PHP, Versions of PHP, Features of PHP, Advantages of PHP over Other Scripting Languages, Installation and Configuration of PHP, Data Types in PHP, PHP Syntax, Comments, PHP Variables and Constants, Scope of Variables, PHP String, String Manipulation, PHP Operators, Precedence of Operators, Expressions, Creating a PHP Script, Running a PHP Script.

Unit-IV
Basic HTML, Embedding PHP in HTML, Passing Information between Pages, PHP $_GET, PHP $_POST, PHP Conditional Statements, PHP Looping Statements, Break, Continue, Exit, PHP Functions: Built-in and User Defined Function, Regular Expression Functions, Mathematical, Date and Time Functions, PHP Arrays: Creating Array and Accessing Array Elements,

PHP File Permissions, Working with Files: Opening, Closing, Reading, Writing a File; Working with Directory: Creating, Deleting, Changing a Directory; Working with Forms: Introduction to a Web Form, Processing a Web Form, Validating a Web Form, Input Validation, PHP with Client Side Scripting Language, Exception and Error Handling in PHP, Introduction to Cookies and Session Handling,

Unit-V
Working with Database: PHP-Supported Databases; Using PHP & My SQL: Installation and Configuration of My SQL on Windows, Checking Configuration, Connecting to Database, Selecting a Database, Adding Table and Altering Table in a Database, Inserting, Deleting and Modifying Data in a Table, Retrieving Data, Performing Queries, Processing Result Sets,

Code Re-use, require(), include(), and the include path, File System Functions and File Input and Output, File Uploads, Use of CSS, Introduction to Object Oriented Programming with PHP, Installing and Configuring Apache to use PHP on Windows, php.ini File,

TEXT & REFERENCE BOOKS:
• PHP & MY SQL, BY VIKRAM VASWANI, TMH PUBLICATIONS
• PHP ESSENTIALS, BY JULIE C. MELONI, BPB PUBLICATIONS
• PHP 5 AND MY SQL BIBLE, BY TIM CONVERSE AND JOYCE PARK, WILEY-DREAMTECH INDIA PUBLICATIONS
• WEB TECHNOLOGIES, BLACK BOOK, DREAMTECH PRESS
• ATKINSON, LEON. CORE PHP PROGRAMMING, NEW YORK: PRENTICE HALL
• LEARNING PHP 5, BY DAVID SKLAR PUBLISHER O'REILLY MEDIA
• MASTERING PHP, BY CHARLES, PUBLISHER: BPB
• EXPERT PHP AND MYSQL, WROX PROGRAMMER TO PROGRAMMER, WROX PRESS, 2010
• PHP FOR ABSOLUTE BEGINNERS, APRESS, 2009
• SAMS TEACH YOURSELF CSS IN 24 HOURS (2ND EDITION), SAMS PUBLISHING, 2006
• HTTP:// WWW.PHPBUILDER.COM
• HTTP://PHP.FAQTS.COM

Computer Oriented Numerical Techniques

Unit – I
Computer Arithmetic : Floating–Point Arithmetic and Errors, Rounding and Chopping of a Number and Associated Errors, Floating Point Representation of Numbers, Truncation errors and Taylor's Series.

Unit - II
Solution of Linear Algebraic Equations: Preliminaries, Direct Methods, Gauss Elimination Method (Basic), Gauss Elimination Method (Row Interchanges: Pivotal condensation),Iterative Methods, Gauss Jacobi Iterative Method, The Gauss-Seidel Iteration Method, Comparison of Direct and Iterative Methods.

Solution of Non-linear Equations : Non Linear Equations, Solution of Non Linear Equations, Successive Substitution Method(Fixed point method), Bisection Method ,Newton-Raphson Method, Regulafalsi Method, Secant Method.

Unit - III
Operator : What is Interpolation, Some Operators and their Properties, Interrelation between operators, Applications of operators on some functions.

Interpolation with Equal Intervals : Difference Table, Interpolation Methods, Newton Forward Difference Formula, Newton Backward Difference Formula, Central Difference Formula, Stirling's Formula, Bessle's Formula.

Unit - IV
Interpolation with Unequal Intervals: Lagrange's Method, Divided Difference Method, Divided Difference Table, Newton's Divided Difference Method.

Numerical Differentiation: Differentiation by Forward/Backward Difference Formula, Differentiation by Central Difference Formula.

Unit - V
Numerical Integration: Methodology's of Numerical Integration, Rectangular Rule, Trapezoidal Rule, Simpsons (1/3) Rule.

Ordinary Differential Equation: Initial Value and Boundary Value Problem, Euler's Method, Improved Euler's Method, Runge Kutta (R-K) Methods (of Order 2 and 4).